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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/529,866

03/30/2005

Yuji Yamanishi

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2252

23370 7590 06/29/2007
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EXAMINER

SAVAGE, JASON L

ART UNIT

PAPER NUMBER

1775

MAIL DATE

DELIVERY MODE

06/29/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/529,866

Applicant(s)

YAMANISHI ET AL

Examiner

Jason L. Savage

Art Unit

1775

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _____ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 20050330.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2 and 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okabe et al. (US 2003/0228949).

Okabe teaches a sintered gear sprocket composed of a sintered alloy having densified surface portions on the gear sprocket structure (par[0013]). Okabe further teaches that treated sprocket is formed by compressing the alloy material, then sintered, and rolled to form densified layers on the sprocket teeth having a thickness between 200 to 800 microns (par[0031]). It would have been within the purview of one of ordinary skill in the art to have selected any densification layer thickness within the recited for the surface regions if the gear teach with a reasonable expectation of success. The subject matter as a whole which was disclosed by Okabe would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, see *In re Malagari* 182 USPQ 549. For instance, it would have been obvious to have selected a thickness 300 microns for the tooth surface, bottom land and on the crest since Okabe teaches that such a thickness is suitable.

Okabe is silent to the porosity in the densified layer; however, it is the position of the Examiner that the densified gear surfaces of Okabe would have porosities within the claimed range since it teaches the same sintered metal alloy and subjecting them to rolling (par[0019]). Okabe further teaches that the density of the densified layers may be more than 7.6 g/cm^3 (par([0019]) which would indicate that the majority of the porosity if not all has been removed by the rolling densification process.

Regarding the limitation that the boundary of the first densified layer is continuous with a boundary of the second densified layer, although Okabe does not exemplify an embodiment wherein the boundary between the two densified layers is continuous, forming such a continuous boundary is known. It would have been within the purview of one of ordinary skill in the art at the time of the invention to have formed the claimed continuous boundary with a reasonable expectation of success.

Regarding claim 2, Okabe does not explicitly recite the densified layer is formed on a tooth crest. However, it does not limit the areas where the densified layer is formed. As such, it would have been within the purview of one of ordinary skill in the art to have treated the crest of the tooth to a rolling step with a reasonable expectation of success of producing a densified surface structure. As recited above, forming the layer having a thickness of 300 microns and a porosity of 10% or less would have been obvious.

Regarding claims 6-7, the sintered gear sprocket of Okabe is taught as being suitable for use for power transmission to a chain (par[0001]).

Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okabe et al. (US 2003/0228949) as applied to claims 1-2 and 6-7 above, further in view of Fujiwara et al. (US 2003/0061904).

Okabe teaches what is set forth above but is silent to the claim limitations.

Fujiwara teaches a sintered gear sprocket composed of a sintered alloy having densified surface portions on the gear sprocket structure (par[0028]). Fujiwara further teaches that the iron alloy used may be an alloy of Fe-Ni-Mo-C wherein the concentration of the alloying elements anticipate the concentrations claimed (par[0006]). Fujiwara also teaches that the overall density of the sintered gear may be between 7.04-7.07 g/cm³ (Table 1).

It would have been within the purview of one of ordinary skill in the art to have recognized that a wide variety of iron alloy materials could be used in forming the sintered gear sprocket of Okabe including the Fe-Ni-Mo-C alloy of Fujiwara with a reasonable expectation of success. Furthermore, the thus formed sintered gear sprocket would have an overall density within the range claimed in claim 5.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okabe et al. (US 2003/0228949) as applied to claims 1-2 and 6-7 above, further in view of Cole et al. (US 5,711,187).

Okabe teaches what is set forth above but is silent to the claim limitations.

Cole et al. (US 5,711,187) teaches a sintered gear sprocket composed of a sintered alloy having densified surface portions on the gear sprocket structure (col. 1, ln.

Art Unit: 1775

5-23). Cole further teaches that treated sprocket is formed by compressing the alloy material, then sintered, and rolled to form densified layers on the sprocket teeth and bottom land (col. 1, ln. 17-62). Cole further teaches that the density in the densified surface regions are 90 to 100% (col. 1, ln. 36-62). Cole also teaches that the density of the sintered gear component prior to densification of the surface is approximately 90%.

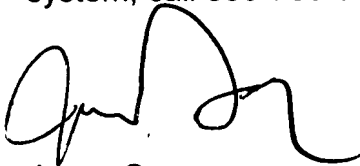
Although Cole and Okabe do not exemplify an embodiment wherein the density of the difference between the sintered alloy core prior to densification and the densified surface layers is 7% or less, it teaches density ranges for the layers which would fall within the claimed range. For instance the sintered alloy may have a porosity of 90% as disclosed by Cole and the densified layers may have a porosity from 90% to 100%. As such, the prior art would overlap the claimed range of having a porosity difference of 7% or less when the densified layers have a density of between 90-97%. It would have been obvious to one of ordinary skill in the art at the time of the invention to have formed the composite sprocket gear having any density or porosity within the claimed range with a reasonable expectation of success.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason L. Savage whose telephone number is 571-272-1542. The examiner can normally be reached on M-F 6:30-4:00.

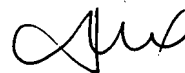
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1775

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Jason Savage
6-22-07



JENNIFER C. MCNEIL
SUPERVISORY PATENT EXAMINER

6/25/7